WHAT IS CLAIMED IS:

1. A composition comprising an isolated polynucleotide encoding an amino-terminal-modified chemokine, wherein the chemokine is selected from the group consisting of SDF-1α, SDF-1β, IP-10, Mig, GROα, GROβ, GROγ, interleukin-8, PF4, ENA-78, GCP-2, PBP, CTAP-III, β-thromboglobulin, NAP-2, C10, DC-CK1, CKα1, CKα2, MCP-1, MCP-2, MCP-3, MCP-4, MIP-1α, MIP-1β, lymphotactin, ATAC, eotaxin, eotaxin2, I-309, HCC-1, HCC-2, HCC-3, LARC/MIP-3α, MIP-3β, PARC, TARC, 6Ckine, ELC, SLC, CKβ4, CKβ6, CKβ7, CKβ8, CKβ9, CKβ11, CKβ12, CKβ13, and CX3C.

2. The composition of claim 1 wherein the amino-terminal-modified chemokine comprises at least one methionine residue covalently attached to the amino terminus of the chemokine.

3. The composition of claim 1 wherein the amino-terminal-modified chemokine comprises at least one aminooxypentane residue covalently attached to the amino terminus of the chemokine.

4. The composition of claim 1 wherein the amino-terminal-modified chemokine comprises at least one GroHEK peptide covalently attached to the amino terminus of the chemokine.

5. A composition comprising an isolated polynucleotide encoding an amino-terminal-modified chemokine, wherein the amino-terminal-modified chemokine is derived from a chemokine selected from the group consisting of SDF-1α, SDF-1β,

IP-10, Mig, GROα, GROβ, GROγ, interleukin-8, PF4, ENA-78, GCP-2, PBP, CTAP-III, β-thromboglobulin, NAP-2, C10, DC-CK1, CKα1, CKα2, MCP-1, MCP-2, MCP-3, MCP-4, MIP-1α, MIP-1β, RANTES, lymphotactin, ATAC, eotaxin, eotaxin2, I-309, HCC-1, HCC-2, HCC-3, LARC/MIP-3α, MIP-3β, PARC, TARC, 6Ckine, ELC, SLC, CKβ4, CKβ6, CKβ7, CKβ8, CKβ9, CKβ11, CKβ12, CKβ13, and CX3C.

6. The composition of claim 1 wherein the polynucleotide is selected from the group consisting of:

(a) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:6;

(b) a polynucleotide comprising the nucleotide sequence of the protein-coding sequence of the polynucleotide encoding met-hSDF-1α deposited under accession number ATCC 98506;

(c) a polynucleotide encoding an amino-terminal-modified chemokine comprising the amino acid sequence of SEQ ID NO:10;

(d) a polynucleotide encoding a protein comprising an amino-terminal fragment of the of the amino acid sequence of SEQ ID NO:10;

(e) a polynucleotide comprising a nucleotide sequence complementary to any one of the polynucleotides specified in (a)-(d) above; and

(f) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(e) above.

7. The composition of claim 1 wherein the polynucleotide is selected from the group consisting of:

(a) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:7;

(b) a polynucleotide comprising the nucleotide sequence of the protein-coding sequence of the polynucleotide encoding met-hSDF-1β deposited under accession number ATCC 98507;

(c) a polynucleotide encoding an amino-terminal-modified chemokine comprising the amino acid sequence of SEQ ID NO:11;

(d) a polynucleotide encoding a protein comprising an amino-terminal fragment of the of the amino acid sequence of SEQ ID NO:11;

(e) a polynucleotide comprising a nucleotide sequence complementary to any one of the polynucleotides specified in (a)-(d) above; and

(f) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(e) above.

8. The composition of claim 1 wherein the polynucleotide is selected from the group consisting of:

(a) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:8;

(b) a polynucleotide comprising the nucleotide sequence of the protein-coding sequence of the polynucleotide encoding GroHEK/hSDF-1α deposited under accession number ATCC 98508;

(c) a polynucleotide encoding an amino-terminal-modified chemokine comprising the amino acid sequence of SEQ ID NO:12;

(d) a polynucleotide encoding a protein comprising an amino-terminal fragment of the of the amino acid sequence of SEQ ID NO:12;

(e) a polynucleotide comprising a nucleotide sequence complementary to any one of the polynucleotides specified in (a)-(d) above; and

(f) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(e) above.

9. The composition of claim 1 wherein the polynucleotide is selected from the group consisting of:

(a) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:9;

(b) a polynucleotide comprising the nucleotide sequence of the protein-coding sequence of the polynucleotide encoding GroHEK/hSDF-1β deposited under accession number ATCC 98509;

(c) a polynucleotide encoding an amino-terminal-modified chemokine comprising the amino acid sequence of SEQ ID NO:13;

(d) a polynucleotide encoding a protein comprising an amino-terminal fragment of the of the amino acid sequence of SEQ ID NO:13;

(e) a polynucleotide comprising a nucleotide sequence complementary to any one of the polynucleotides specified in (a)-(d) above; and

(f) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(e) above.

10. A composition of claim 1 wherein the polynucleotide is operably linked to an expression control sequence.

11. The composition of claim 10 wherein the polynucleotide is further operably linked to a sequence directing secretion of the expressed amino-terminal-modified chemokine.

12. A host cell transformed with a composition of claim 10.

13. The host cell of claim 12, wherein the cell is a mammalian cell.

14. A process for producing an amino-terminal-modified chemokine, which comprises:

(a) growing a culture of the host cell of claim 12 in a suitable culture medium; and

(b) purifying the amino-terminal-modified chemokine from the culture.

15. A polypeptide produced according to the process of claim 14.

16. A process for producing an amino-terminal-modified chemokine in a host, which comprises:

(a) isolating stem cells from the host;

(b) transforming the stem cells with the composition of claim 10; and

(c) reintroducing the transformed stem cells into the host, wherein the transformed stem cells will express the amino-terminal-modified chemokine.

17. A composition comprising an isolated polynucleotide encoding an amino-terminal-modified chemokine, wherein the chemokine binds the fusin/CXCR4 chemokine receptor.

18. A composition comprising an isolated polynucleotide encoding an amino-terminal-modified chemokine, wherein the amino-terminal-modified chemokine is a more effective inhibitor of HIV infection than the corresponding unmodified chemokine.

19. A composition comprising an amino-terminal-modified chemokine, wherein the chemokine is selected from the group consisting of SDF-1α, SDF-1β, IP-10, Mig, GROα, GROβ, GROγ, interleukin-8, PF4, ENA-78, GCP-2, PBP, CTAP-III, β-thromboglobulin, NAP-2, C10, DC-CK1, CKα1, CKα2, MCP-1, MCP-2, MCP-3, MCP-4, MIP-1α, MIP-1β, lymphotactin, ATAC, eotaxin, eotaxin2, I-309, HCC-1, HCC-2, HCC-3, LARC/MIP-3α, MIP-3β, PARC, TARC, 6Ckine, ELC, SLC, CKβ4, CKβ6, CKβ7, CKβ8, CKβ9, CKβ11, CKβ12, CKβ13, and CX3C.

20. The composition of claim 19 wherein the amino-terminal-modified chemokine comprises at least one methionine residue covalently attached to the amino terminus of the chemokine.

21. The composition of claim 19 wherein the amino-terminal-modified chemokine comprises at least one aminooxypentane residue covalently attached to the amino terminus of the chemokine.

22. The composition of claim 19 wherein the amino-terminal-modified chemokine comprises at least one GroHEK peptide covalently attached to the amino terminus of the chemokine.

23. A composition comprising an amino-terminal-modified chemokine, wherein the amino-terminal-modified chemokine is derived from a chemokine selected from the group consisting of SDF-1α, SDF-1β, IP-10, Mig, GROα, GROβ, GROγ, interleukin-8, PF4, ENA-78, GCP-2, PBP, CTAP-III, β-thromboglobulin, NAP-2, C10, DC-CK1, CKα1, CKα2, MCP-1, MCP-2, MCP-3, MCP-4, MIP-1α, MIP-1β, RANTES, lymphotactin, ATAC, eotaxin, eotaxin2, I-309, HCC-1, HCC-2, HCC-3, LARC/MIP-3α, MIP-3β, PARC, TARC, 6Ckine, ELC, SLC, CKβ4, CKβ6, CKβ7, CKβ8, CKβ9, CKβ11, CKβ12, CKβ13, and CX3C.

24. The composition of claim 19 wherein the amino-terminal-modified chemokine comprises an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of SEQ ID NO:10;

(b) the amino acid sequence of the protein encoded by the met-hSDF-1α polynucleotide deposited under accession number ATCC 98506;

(c) amino-terminal fragments of the amino acid sequence of SEQ ID NO:10; and

(d) amino-terminal fragments of the amino acid sequence of the protein encoded by the met-hSDF-1α polynucleotide deposited under accession number ATCC 98506.

25. The composition of claim 19 wherein the amino-terminal-modified chemokine comprises an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of SEQ ID NO:11;

(b) the amino acid sequence of the protein encoded by the met-hSDF-1β polynucleotide deposited under accession number ATCC 98507;

(c) amino-terminal fragments of the amino acid sequence of SEQ ID NO:11; and

(d) amino-terminal fragments of the amino acid sequence of the protein encoded by the met-hSDF-1β polynucleotide deposited under accession number ATCC 98507.

26. The composition of claim 19 wherein the amino-terminal-modified chemokine comprises an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of SEQ ID NO:12;

(b) the amino acid sequence of the protein encoded by the GroHEK/hSDF-1α polynucleotide deposited under accession number ATCC 98508;

(c) amino-terminal fragments of the amino acid sequence of SEQ ID NO:12; and

(d) amino-terminal fragments of the amino acid sequence of the protein encoded by the GroHEK/hSDF-1α polynucleotide deposited under accession number ATCC 98508.

27. The composition of claim 19 wherein the amino-terminal-modified chemokine comprises an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of SEQ ID NO:13;

(b) the amino acid sequence of the protein encoded by the GroHEK/hSDF-1β polynucleotide deposited under accession number ATCC 98509;

(c) amino-terminal fragments of the amino acid sequence of SEQ ID NO:13; and

(d) amino-terminal fragments of the amino acid sequence of the protein encoded by the GroHEK/hSDF-1β polynucleotide deposited under accession number ATCC 98509.

28. The composition of claim 19, further comprising a pharmaceutically acceptable carrier.

29. A composition comprising an antibody which reacts with the amino-terminal-modified chemokine of claim 19, but does not react with the unmodified chemokine.

30. A method for identifying molecules capable of interacting with an amino-terminal-modified chemokine which comprises:

(a) combining a composition of claim 19 with an indicator molecule and with a composition comprising molecules to be tested for interaction; and

(b) detecting the presence of altered indicator molecules.

31. A method for altering receptor function which comprises causing a receptor to bind at least one amino-terminal-modified chemokine of claim 19.

32. A method for inhibiting the interaction between a chemokine receptor and a ligand of the receptor which comprises causing the receptor to bind at least one amino-terminal-modified chemokine of claim 19.

33. A method for decreasing receptor function which comprises causing a receptor to bind at least one amino-terminal-modified chemokine of claim 19, resulting in a decrease in the number of functional receptor molecules.

34. A method for preventing, treating, or ameliorating HIV infection which comprises administering therapeutically effective amounts of at least one composition of claim 19.

35. The method of claim 34, wherein the compositions administered comprise:

(a) an amino-terminal-modified chemokine comprising a chemokine selected from the group consisting of SDF-1α and SDF-1β; and

(b) an amino-terminal-modified chemokine comprising a chemokine selected from the group consisting of MIP-1α and MIP-1β.

36. A method for identifying amino-terminal-modified chemokines capable of inhibiting the interaction of HIV with an HIV receptor which comprises:

(a) combining a composition of claim 19 with a composition comprising HIV receptor molecules, forming a first mixture;

(b) combining the first mixture with a composition comprising HIV molecules, forming a second mixture;

(c) combining a composition comprising HIV receptor molecules with a composition comprising HIV molecules, forming a control mixture;

(d) determining the amount of interaction between the HIV molecules and the HIV receptor molecules in the second mixture and in the control mixture; and

(e) comparing the amount of interaction between the HIV molecules and the HIV receptor molecules in the second mixture with the amount of interaction between the HIV molecules and the HIV receptor molecules in the control mixture, wherein the amino-terminal-modified chemokine inhibits the interaction of HIV with the HIV receptor when the amount of interaction between the HIV molecules and the HIV receptor molecules is less in the second mixture than in the control mixture.

37. A method for identifying amino-terminal-modified chemokines capable of inhibiting the infection by HIV of cells susceptible to HIV infection which comprises:

(a) combining a composition of claim 19 with a composition comprising cells susceptible to HIV infection, forming a first mixture;

(b) combining the first mixture with a composition comprising HIV particles, forming a second mixture;

(c) combining a composition comprising cells susceptible to HIV infection with a composition comprising HIV particles, forming a control mixture;

(d) determining the amount of infection of the susceptible cells by HIV in the second mixture and in the control mixture; and

(e) comparing the amount of infection of the susceptible cells by HIV in the second mixture with the amount of infection of the susceptible cells by HIV in the control mixture, wherein the amino-terminal-modified chemokine inhibits the infection of the susceptible cells by HIV when the amount of infection of the susceptible cells by HIV is less in the second mixture than in the control mixture.

38. A method for attracting migratory cells to a region of an organism which comprises administering therapeutically effective amounts of at least one composition of claim 19.

39. A method for stimulating angiogenesis which comprises administering therapeutically effective amounts of at least one composition of claim 19.

40. A method for inhibiting angiogenesis which comprises administering therapeutically effective amounts of at least one composition of claim 19.

41. A method for preventing, treating, or ameliorating an inflammatory condition which comprises administering therapeutically effective amounts of at least one composition of claim 19.

42. A method for preventing, treating, or ameliorating an autoimmune condition which comprises administering therapeutically effective amounts of at least one composition of claim 19.

43. A method for inducing an immune response which comprises administering a vaccine and therapeutically effective amounts of at least one composition of claim 19.

44. A composition comprising an amino-terminal-modified chemokine, wherein the chemokine binds the fusin/CXCR4 chemokine receptor.

45. A composition comprising an amino-terminal-modified chemokine, wherein the amino-terminal-modified chemokine is a more effective inhibitor of HIV infection than the corresponding unmodified chemokine.

46. A method for preventing, treating, or ameliorating HIV infection of a host which comprises:

(a) isolating stem cells from the host;

(b) transforming the stem cells with at least one composition of claim 10; and

(c) reintroducing the transformed stem cells into the host, wherein the transformed stem cells will express at least one amino-terminal-modified chemokine.

47. The method of claim 46, wherein the transformed stem cells express an amino-terminal-modified chemokine comprising a chemokine selected from the group consisting of SDF-1α and SDF-1β; and an amino-terminal-modified chemokine comprising a chemokine selected from the group consisting of MIP-1α and MIP-1β.